Report by the Governor's Interagency Energy Policy Work Group in response to Executive Order 27

January 2002

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This report is a comprehensive set of policy options and recommendations for consideration in the development of an Energy Policy for the State of Tennessee.

Presented by:

Department of Economic and Community Development
and
Department of Environment and Conservation

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Advisory Committee:

American Institute of Architects - Tennessee
American Lung Association
Cumberland Region Tomorrow (Nashville region)
Electric Power Supply Association
Kingsport Power Company/American Electric Power
League of Women Voters of Tennessee
Memphis Light, Gas, and Water
Middle Tennessee State University - Center for Energy Efficiency
Nashville Electric Service
National Federation of Independent Businesses
National Parks Conservation Association
Nature Conservancy of Tennessee
Nine Counties, One Vision (Knoxville region)
Oak Ridge National Laboratory
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Tennessee Valley Authority
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Tennessee Valley Public Power Association
Transportation Management Association Group
University of Tennessee - County Technical Advisory Service
University of Tennessee - Energy, Environment and Resources Center
University of Tennessee - Municipal Technical Advisory Service
World Wildlife Fund - Southeastern Rivers and Streams Project

Energy Policy Work Group:

Reliability/Availability/Quality/Price/Environmental Effects

Department of Economic and Community Development
Department of Environment and Conservation
Governor's Office
Tennessee Regulatory Authority

Energy Efficiency

Comptroller of the Treasury
Department of Economic and Community Development
Department of Human Services
Department of Finance and Administration
Department of General Services
Department of Environment and Conservation

Transportation

Department of Transportation
Department of General Services
Department of Personnel
Department of Environment and Conservation

New Technologies and Clean Power

Department of Agriculture
Department of Correction
Department of Environment and Conservation

Public Education and Information

Department of Environment and Conservation
Department of Personnel
Department of Human Services
Department of Transportation
Tennessee Regulatory Authority
Department of Environment and Conservation

Energy Emergency Planning

Tennessee Emergency Management Agency
Department of Finance and Administration
Department of Military
Department of Military
Department of Environment and Conservation

Interagency Energy Policy Workgroup Administrative Staff Energy Division/Department of Economic & Community Development

Executive Summary

Reliable, affordable energy is the foundation of Tennessee's economy. Tennessee has a strong energy history and a bright energy future. Communities, businesses and families continue to enjoy the benefits of reliable supplies and affordable prices. Both energy producers and consumers are adopting new technologies and practices that effectively expand supplies, improve efficiency and protect natural resources. The result is a sound energy system that balances the needs of a growing economy while protecting the environment and conserving natural resources.

Business and industry have contributed to Tennessee's energy success by demonstrating that sound energy management produces both economic and environmental benefits. Energy consumption by Tennessee's industrial/commercial sector has only increased by 13% since 1980, while the Gross State Product (GSP) has nearly quadrupled during the same period. By making solid investments in energy efficient processes and renewable resources, Tennessee firms have lowered operating costs, improved productivity, and reduced emissions. Driven by the need to continually improve competitiveness, business and industry have led the way in developing innovative energy solutions.

Although Tennessee has not experienced the supply problems of some other states, it is imperative that we take stock of our current use and future demands. Stricter federal clean air standards have forced all states and utilities to closely examine their reliance on fossil fuels. Continued population growth and economic expansion could lead to future energy challenges. In addition, the National Energy Policy has directed all states to evaluate their energy use and production, and consider options to prepare for the

future. It is important that Tennesseans work together to address these challenges by developing a consistent, forward-thinking approach to energy production, distribution and use.

To ensure that Tennessee is prepared to meet future energy challenges, the Governor established the Governor's Interagency Energy Policy Work Group and Advisory Committee on July 24, 2001 by Executive Order 27. The governor charged the work group, consisting of representatives of various state agencies, with developing a set of policy recommendations regarding energy use, supply, sources, technologies and efficiency. In fulfilling this role, the work group requested comments from an advisory committee that included representatives of energy producers, distributors, local governments, environmental groups, business and industry, agriculture and other concerned groups.

After several months of research, dialogue and public comment, the work group developed a set of policy recommendations for each of the following areas:

- reliability, availability, quality, price and environmental effects;
- energy efficiency;
- transportation;
- new technologies and clean power alternatives;
- public education and information; and
- energy emergency planning.

The following paragraphs list key policy recommendations identified by the work group during the planning and public comment process. The policy recommendations presented here and in the body of the report provide a suite of options to support further

development of energy policy in Tennessee. The report outlines broad recommendations and potential areas for action. It is not an end in itself, but a starting point that can guide future energy policy. The work group recommends that under the direction and leadership of the Governor, state policymakers further develop those recommendations with the most merit and opportunity for success. The work group recommends that specific numerical targets and timelines be developed for those recommendations. It is important that Tennessee's business and industry, state and local governments, organizations, citizens and all interested parties continue their dialogue in order to build broad-based support for policies that will ensure reliable and affordable energy supplies that are used in the most efficient, environmentally sound, and cost effective manner possible. The work group recommends that TECD and TDEC continue to lead the coordination of this effort.

In assessing the **reliability, availability, quality, price and environmental effects** of energy supplies, state policymakers should consider the following policy recommendations.

1. Develop the capacity to regularly conduct and communicate energy supply and consumption research, including the ability to develop projections based on alternative economic and other considerations.

2. Assess pipeline and storage capacity for both natural gas and petroleum, project future needs, assess relevant permitting and construction issues and identify steps to address potential supply problems.

3. Consider the flexibility and capacity of Tennessee's fuel distribution system when considering state specific fuel standards.

4. Revisit the state's petroleum contingency plan and assess alternative distribution methods that consider current retail purchasing practices and available technology.

5. Identify and assess coal-related policies and programs that would promote the economic use of Tennessee's coal reserves while meeting current and proposed environmental regulations.

6. Explore opportunities to promote the use of renewable energy in Tennessee, including identifying federal funding opportunities.

7. Implement a cautious development program for merchant power plants in Tennessee.

8. Identify ways to coordinate and expand existing Tennessee-based research and other energy program activities.

In assessing **energy efficiency opportunities** for Tennessee communities, businesses, state buildings and households, state policymakers should consider the following policy recommendations.

1. Strengthen state efforts to maximize all available federal funds for energy-related programs.

2. Partner with communities to increase access to energy efficiency assistance, including energy audits and project financing opportunities.

3. Continue to support and strengthen relationships with the Tennessee Valley Authority and local power distributors through cooperative efforts to develop, market and deliver energy efficiency programs.

4. Seek to strengthen the Low Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP) by advocating full allocation of federally appropriated LIHEAP funds; supporting supplemental federal appropriations that fund the special emergency heating and cooling assistance needs of southern states; and supporting efforts to broaden the state resource base of the Weatherization Assistance Program.

5. Upgrade the energy efficiency code from the 1992 Model Energy Code to the 2000 International Energy Code, with 2001 amendments.

6. Require all executive agencies, the Tennessee Board of Regents and the University of Tennessee system to support and participate in the "Energy Action Plan for Tennessee Buildings."

7. Initiate the development of life-cycle costing formulas for energy-using products purchased by state government that are not currently evaluated.

8. Assess the appropriateness of a public benefits charge, financial incentives, sustainable design programs and other long-term strategies for Tennessee.

In assessing **transportation issues**, state policymakers should consider the following policy recommendations.

1. Encourage all state departments to evaluate telecommuting for their employees.

2. Continue assessing and applying alternative work schedules, teleconferencing and other work methods that save time, reduce travel costs and increase productivity.

3. Take cost-effective steps to expand state vanpool and carpool programs, including procuring additional vans and seeking federal funds.

4. Offer a new pre-tax flexible benefit to state employees that use public transit or vanpools in their commute to work.

5. Participate in federal vehicle efficiency efforts by implementing pilot programs that test and demonstrate new technologies.

6. Provide an alternative fuel facility in the Nashville area.

In assessing opportunities to promote **new technologies and clean power alternatives**, state policymakers should consider the following policy recommendations.

1. Promote TVA's Green Power Switch program.

2. Support initiatives to develop clean renewable technologies and foster greater use of renewable energy in Tennessee.

3. Seek ways to support commercialization of new technologies that benefit manufacturers and position them for future growth.

4. Develop a process for reviewing and facilitating distributed generation opportunities that provide both economic and environmental benefits to Tennessee communities.

5. Support the development and use of clean coal technologies.

6. Support the use of geothermal exchange technology in state buildings and other facilities.

7. Develop partnerships that monitor, demonstrate and communicate information on available technologies and practices.

In assessing **public education and information** issues, state policymakers should consider the following policy recommendations.

1. Develop a sustained and consistent public awareness campaign that effectively educates Tennesseans on the benefits of wise energy use.

2. Appoint an ongoing Energy Education Work Group to evaluate the progress of existing programs, revise messages and plans as needed, develop materials and seek financial support.

3. Enhance the Tennessee Department of Economic and Community Development's Energy website so that it serves as a one-stop shop for anyone seeking energy information.

4. Develop Clean Air Partnerships in major metropolitan areas to offer more transportation choices, enhance mobility and improve air quality.

5. Join with energy providers to develop a statewide Home/Consumer Energy Conservation Partnership that has the goal of reducing Tennessee's per capita energy use.

6. Establish a formal energy education component in K-12 schools.

7. Establish an energy education network of state agencies, schools and other support organizations.

8. Develop and maintain a sustainable comprehensive energy awareness program that involves strong partnerships, collaboration with other states and the necessary resources.

In assessing **energy emergency planning** issues, state policymakers should consider the following.

1. Review and understand recent energy emergency plan updates that place the Tennessee Valley Authority, the Tennessee Regulatory Authority and the Tennessee Department of Economic and Community Development as lead agencies.

2. Review and understand recent energy emergency plan updates that give additional state agencies roles in deliberations regarding response and recovery missions during emergencies.

Reliability, Availability, Quality, Price, and Environmental Effects

National energy demand has grown dramatically over the past 25 years. In some areas this has resulted in significant price increases, interrupted service and regional spot shortages. Although Tennessee has not had the problems of some other states, continued population growth and economic expansion could lead to future energy challenges. It is important that Tennessee addresses these challenges in order to avoid market volatility and take advantage of future economic opportunities.

In light of these considerations, the Governor directed the Energy Policy Work Group to develop recommendations on energy reliability, availability, quality, price and environmental effects. Specifically, Executive Order 27 presented the work group with the opportunity to:

- Develop state policies for securing adequate, affordable supplies of all forms of energy for Tennessee now and in the future; consider a broad and diverse range of policies, programs and initiatives to accomplish this goal; and assess the impacts of energy choices and alternatives;
- Establish policies and guidelines for the approval and siting of new energy resource exploration activities, energy resource extraction activities and energy production facilities in order to remove barriers to energy development and protect the environment while making the most of Tennessee's potential; and
- Investigate new energy technologies and strategies and their potential application in Tennessee; seek participation in all new appropriate national energy programs to achieve the maximum benefits for Tennessee citizens; and identify promising areas for research and help to obtain financial support for priority research efforts.

Background Information

Tennessee uses a diverse supply of energy to drive the state's economy, including petroleum (713 trillion Btu), coal (626 trillion Btu), nuclear (289 trillion Btu), natural gas (286 trillion Btu), hydroelectricity (74 trillion Btu), wood and wood waste (48 trillion Btu) and solar and wind (0.1 trillion Btu).

These energy sources are used in many ways. Over 50 percent of the state's petroleum consumption, for example, is used for motor gasoline. Remaining petroleum consumption is in the form of distillate fuel, jet fuel, kerosene, asphalt and road oil and various other products. Almost 90 percent of coal consumption is used to generate electricity. Most of the remaining ten percent is used directly by industry. Fifty percent of natural gas consumption goes toward industrial use, 39 percent is used to heat commercial and residential buildings and the remainder is used to produce electricity.

Tennessee has a history of reliable and affordable energy supplies. Although state consumption is double its production, its strong electric system and energy distribution system have met the needs of a growing economy. In 1999, Tennessee ranked 16th in the nation in energy consumption. The state's industrial sector also ranked 16th in consumption, while the transportation sector ranked 17th. The commercial and residential sectors ranked 16th and 14th, respectively.

On average, Tennessee paid $8.60 per million Btu, less than the national average of $8.82. Tennessee's electric prices ranked 40th in the nation, coal prices ranked 37th, petroleum prices ranked 33rd, gasoline prices ranked 33rd and natural gas prices ranked 17th.

Tennessee, like other states, faces a rapidly changing economy and regulatory environment. Multiple energy sources will be needed to meet growing demand. Every energy source, ranging from coal to solar, involves various applications, technologies, distribution systems, economic costs and benefits and environmental impacts. Government agencies, private sector firms, community groups and numerous trade associations actively participate in the political process to affect decisions on production sites, transportation alternatives, environmental regulations and other energy-supply issues. The importance of these issues, coupled with the breadth of participation, make it essential that state policymakers develop the mechanisms and processes needed to ensure sound energy supply practices.

State government is active on several energy fronts. The Tennessee Regulatory Agency (TRA), for example, regulates investor-owned utility rates and service and enforces natural gas pipeline safety standards. The Tennessee Department of Environment and Conservation's (TDEC) regulatory and informational responsibilities give it a vital role in protecting the state's air quality, water resources and other natural resources affected by energy supply decisions. The Tennessee Department of Economic and Community Development (TECD) is also involved in energy supply decisions through Energy Division efforts in managing federal energy programs, promoting renewable energy technologies, developing statistical information and maintaining the state's petroleum contingency plan.

As shown by public comments submitted to the Governor's Interagency Energy Policy Work Group, a number of organizations have major efforts currently underway that will impact the reliability, availability, quality, price and environmental effects of

Tennessee's energy supplies. Several independent power companies, for example, have expressed an interest in building natural gas-fired electric production facilities in the state. The Tennessee Valley Authority, municipal distributors, rural cooperatives and affected communities are actively engaged in discussions regarding the costs and benefits of these and other approaches to increasing electric supply. Other energy supply questions have also drawn comments from various groups. Their concerns include petroleum pipeline expansion, in-state distribution, and storage capacity; access to natural gas pipelines; coal development and transportation; renewable energy development; and the impact of energy production and consumption on air and water quality.

Policy Recommendations

In assessing the reliability, availability, quality, price and environmental effects of current and future energy supplies, state policymakers should consider the following policy recommendations.

1. State and community policymakers need accurate and accessible information to make sound energy supply decisions. Although a number of organizations currently develop data and projections for various energy types and specific projects, there is not a mechanism to integrate current research and develop comprehensive projections for the state and affected communities. To address this shortcoming, **state policymakers should consider developing the capacity to regularly conduct and communicate energy supply and consumption research, including the ability to develop projections based on alternative economic, efficiency, environmental and policy considerations.** In developing

this capacity, state policymakers should build on, collaborate and coordinate existing work currently being done by state agencies, state universities, federal agencies and other organizations.

2. Tennessee must maintain a strong system for transporting natural gas and petroleum to various markets in the state. **State policymakers should assess pipeline and storage capacity for both natural gas and petroleum, project future needs, assess relevant permitting and construction issues and identify steps to address potential supply problems**. State policymakers should coordinate efforts with relevant federal agencies, pipeline firms, marketers and neighboring states to develop needed information.

3. Cleaner transportation fuels will play a significant role in attaining air-quality standards. The federal Environmental Protection Agency has promulgated regulations that will continue to reduce the sulfur content of gasoline and provide reductions in air emissions. **State policymakers should consider the flexibility and capacity of Tennessee's fuel distribution system when considering state specific fuel standards.**

4. Tennessee has a petroleum contingency plan that describes the processes that can be implemented in the event of fuel shortages. **State policymakers should consider revisiting the plan and assess alternative distribution methods that would consider retail purchasing practices and currently available technology**.

5. A myriad of public policy issues affect the use of Tennessee coal reserves. **State policymakers should identify state and federal policies and programs that**

would promote the economic and cleaner utilization of Tennessee's coal reserves for fuels and chemicals while meeting current and proposed environmental regulations.

6. Renewable energy sources will play an increasingly important role in Tennessee's energy future. **State policymakers should explore opportunities to promote the use of renewable energy in Tennessee**. This could include identifying federal funding opportunities, evaluating the costs and benefits of specific incentives for renewable energy production and expanding education and training opportunities for engineers working in the renewable energy field. Policymakers should coordinate efforts with existing federal and state programs currently underway.
7. The location and development of energy production facilities present a range of economic costs and benefits, environmental impacts, and public policy concerns. The rapidly changing regulatory environment makes it difficult to anticipate all future deregulation issues. **State policymakers should implement a cautious development program for merchant power plants in Tennessee.** During this two-year development program**,** participating government agencies should conduct a full, comprehensive study that could result in state and federal legislation. (See the *Merchant Plant Development Program* description following this section).
8. Federal and state agencies, universities and private firms are currently engaged in numerous activities related to the research and development of energy technology. **State policymakers should identify ways to coordinate and expand existing**

Tennessee-based research and other energy program activities. A coordinated approach will optimize the state's ability to secure federal and foundation funding for research activities and other energy programs that contribute to economic development and environmental quality.

9. Reliability of electricity supply largely depends on the reliability and security of electric transmission and distribution systems. The increasing implementation of different types of distributed generation devices raises complex concerns related to safety and grid reliability that should be weighed against the expected benefits from distributed generation. Instabilities initiated from locally operated distributed resources can propagate through the distribution and transmission systems, thus affecting electricity supply for larger regions. **State policymakers should identify ways to ensure that distribution and transmission interconnection standards promote system reliability and safety**.

Merchant Plant Development Program

Independent power producers are planning numerous merchant power plants throughout the southeastern United States. It is essential that Tennessee communities, power producers and distributors, state agencies and other stakeholders work cooperatively to ensure that these new generation sources are developed in a coordinated manner that considers energy needs, economic and environmental impacts and interconnection and infrastructure issues. For the purpose of this discussion, a merchant plant or independent power producer is an electric generating facility of 50 MW or larger. It is a private entity that operates a generation facility and sells power to electric utilities for resale to retail customers. (Reference Source: National Association of Regulatory Utility Commissioners)

To give the state of Tennessee the opportunity to fully understand and evaluate the benefits and impacts of merchant power plants, in August 2001 the Governor's Office directed the Commissioner of the Department of Environment and Conservation not to accept any new applications for merchant power plants until the issue could be further studied. The Energy Policy Work Group was charged with studying this issue and making recommendations.

The rapidly changing regulatory environment makes it difficult for the work group to anticipate all future energy needs in Tennessee. Having said this, **it is important that state policymakers act now by implementing a cautious development program for merchant power plants in Tennessee**. During this two-year development program, participating government agencies should conduct a full, comprehensive study that could result in state and federal legislation. It is important that state policymakers

collect and use information on relevant merchant plant issues, including experience with the development program, in developing a long-term policy for new power plants. State policymakers should consider the following state roles and issues when establishing the development program.

- Independent power producers who wish to participate in the program would submit a merchant plant application and processing fee to TECD which reflects the magnitude of the project and the work required to process the application.
- TECD would work with the applicant, the impacted community, TRA and other stakeholders to develop information on project need, costs and benefits. TECD would screen applicants to determine whether or not a proposed plant provides economic benefit to Tennessee, in consultation with communities and other stakeholders, and would recommend those appropriate for further consideration. This process would include among other considerations determining if the project is needed to meet expected energy demands and determining if the plant will have significant economic benefits for Tennessee. In addition, TECD will consult with appropriate parties to determine the impact of the project on the transmission system and capacity, as well as transmission and economic issues related to its proposed location.
- Applicants would be responsible for negotiating interconnection and power purchase.
- If TECD recommends a project for further consideration, the application will be forwarded to TDEC for environmental permitting.
- TDEC would address air quality, water resources and solid waste management issues. Tentative requirements are outlined below.

- TDEC would seek out public input on all permit applications through its public participation process.

Air Quality

a. All electricity generating units of any size would be required to meet best achievable control technology (BACT) standards.
b. Permit applicants would request comment from Federal Land Managers regarding impact on Class I areas.
c. Consideration must be given to the cumulative effects of multiple power plants.

Water Resources

a. TDEC would require that all applicants provide clear and convincing evidence that there will be no adverse impact on water supplies or water quality before authorizing new power plant construction. This would include both surface and groundwater. TDEC would demand a high burden of proof from the applicant that any proposed withdrawal can be supported by the available water supply, and will not harm the environment or adversely affect existing water users.
b. All power plants would assess the feasibility of using reclaimed water to generate steam.

Solid Waste Management

TDEC would require that all power plants submit a satisfactory solid waste management plan. This requirement should apply whether or not solid wastes

generated by the facility are formally designated as regulated substances.

Threatened and Endangered Species

The applicant shall comply with all state and federal laws relating to threatened or endangered species.

- TECD, TDEC and TRA may limit the number of merchant power plants in the development project and would closely monitor the development and operation of merchant plant development projects, and periodically report on project impacts over the two-year development period.
- TECD and TDEC may exempt certain small plants from some requirements.
- TDEC would develop guidance documents for siting merchant power plants.
- TDEC would work to ensure that the state's final policy on power plants is consistent with multi-state efforts currently underway to reduce emissions from power plants.
- To improve environmental quality and reduce the need for additional power generation capacity, the state of Tennessee would develop a comprehensive energy conservation and efficiency program. This long-term effort will begin with existing programs as a foundation. Additional initiatives and programs would fill in gaps and enhance current efforts.

Energy Efficiency

Energy conservation must be a cornerstone of any long-term energy policy in Tennessee. Improved energy efficiency helps achieve conservation, increases industrial competitiveness, contributes to community development and reduces business and household costs. In addition to strengthening local economies, energy efficiency is one of the most effective ways to meet short-term increases in energy demand. Because of the tremendous economic and environmental benefits improved energy efficiency can bring, it is important that Tennesseans continue to seek new and more efficient ways to produce goods and services, heat and cool buildings and power vehicles.

In light of these considerations, the Governor directed the Energy Policy Work Group to develop recommendations that strengthen Tennessee's energy efficiency efforts. Specifically, Executive Order 27 presented the work group with the opportunity to:

- Consider state partnerships with communities and local governments that identify energy efficiency opportunities;
- Study and report on energy use in Tennessee state facilities; summarize existing state energy management programs; and identify future steps that will reduce expenditures, increase efficiencies and reduce energy consumption; and
- Assess state purchasing policies that require the use of life cycle costing when purchasing energy-using products.

Background Information

Tennessee consumes almost $9 billion worth of energy per year. This amount increases as the economy grows and should top $10.5 billion for the year 2002 (U.S. Department of Energy, Energy Information Administration). Improving the energy efficiency of industrial processes, commercial and residential buildings and vehicles can reduce the growth of these expenditures and provide positive economic benefits for communities.

Several state agencies promote energy efficiency by providing grants, loans, technical assistance and training to communities, households and various economic sectors. The Tennessee Department of Human Services, for example, administers two federally funded assistance programs for low-income families: the Low Income Home Energy Assistance Program (LIHEAP) and the Weatherization Assistance Program (WAP). LIHEAP provides financial assistance to low-income households to help pay home energy bills, while WAP helps reduce energy costs by improving the energy efficiency of low-income residences.

The Tennessee Department of Economic and Community Development (TECD), through its Energy Division, is charged by state legislation to provide a broad range of energy efficiency programs to businesses and industry, state and local governments, schools and other energy consumers. TECD administers several federal programs that provide energy audits and other technical assistance to small businesses, schools and local governments. TECD also administers two highly popular loan programs that help small businesses, schools and local governments finance energy efficiency improvements. TECD has partnered with chambers of commerce, local governments,

energy distributors and other community-based organizations to promote these programs and help local building owners install new heating and cooling systems, energy efficient lighting and other cost-saving projects.

Building codes can offer a cost-effective way to improve energy efficiency practices. In 1994, the state of Tennessee adopted the 1992 Model Energy Code published by the Council of American Building Officials. The code, which has been adopted by communities across the state, prescribes insulation levels, equipment efficiencies and other construction specifications that improve building energy efficiency.

Two programs focus on improving the energy efficiency of state government operations. The State Building Energy Management Program (SBEM), administered by the Tennessee Department of Finance and Administration, is responsible for providing energy information and other assistance to help state agencies identify and implement energy efficiency measures. In addition, the Purchasing Division of General Services has established life cycle cost formulas affecting purchasing contracts for air-conditioners, vehicles and various energy-using appliances.

Several organizations outside state government have also been active in promoting energy efficiency in Tennessee. The Tennessee Valley Authority, for example, has worked closely with local electric distributors to deliver programs to industrial, commercial, and residential customers. Programs for commercial and industrial customers include lighting surveys, transformer sizing, capacitor assistance and other planning services. Residential programs include energy audits, heat pump financing, water heater rebates and planning services.

Policy Recommendations

In assessing energy efficiency opportunities for Tennessee communities, businesses, state buildings and households, state policymakers should consider the following policy recommendations.

1. The U.S. Department of Energy, U.S. Environmental Protection Agency and other federal agencies sponsor energy efficiency programs that benefit Tennessee citizens, businesses and communities. TECD currently participates in several federal programs. **State policymakers should strengthen state efforts to maximize all available federal funds for energy-related programs.** These efforts would leverage federal dollars to expand technical assistance, information and financing opportunities for Tennessee communities.
2. Excessive energy costs can affect a firm's ability to compete in global markets. Similarly, energy costs can reduce funding that schools and local governments have available for essential services. It is important that business owners, school administrators and local government officials have access to the information and financing they need to improve energy efficiency and manage energy costs. **State policymakers should partner with communities to increase access to energy efficiency assistance, including energy audits and project financing opportunities.** These efforts should build on current community partnerships to strengthen existing programs and aggressively pursue new programs.
3. Over the years, state agencies have developed strong relationships with the Tennessee Valley Authority (TVA) and local power distributors. These relationships have enhanced state and TVA programs that help energy consumers identify and finance

energy-saving projects. **State policymakers should continue to support and strengthen these mutually beneficial relationships through cooperative efforts to develop, market and deliver energy efficiency programs.** Possible areas for cooperation include industrial and commercial programs, residential programs, consumer education and training.

4. The Low Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP) provide essential services to low-income Tennessee citizens. **State policymakers should seek to strengthen the Low Income Home Energy Assistance Program (LIHEAP) and Weatherization Assistance Program (WAP) by advocating full allocation of federally appropriated LIHEAP funds; supporting supplemental federal appropriations that fund the special emergency heating and cooling assistance needs of southern states; and supporting efforts to broaden the s**tate resource base of the Weatherization Assistance Program. This includes: supporting state requirements that ten percent of federal LIHEAP funds be transferred to WAP for long term energy efficiency activities; supporting the federal focus on expanding WAP services to make low-income housing more energy efficient; monitoring the impact of lead-based paint regulations on WAP activities; and implementing new WAP activities that decrease household energy costs through the purchase of energy efficient major appliances.
5. The International Code Council (formerly the Council of American Building Officials) published its most recent "International Energy Conservation Code" (IEC) in 2000, and subsequent amendments in 2001. The new code incorporates energy-saving improvements to technology and construction practices that have occurred

since Tennessee adopted the 1992 Model Energy Code (MEC). **State policymakers should upgrade the energy efficiency code from the 1992 MEC to the 2000 IEC, with 2001 amendments.** Policymakers should also consider making automatic upgrades to the code as new versions are published, and seek grant funds for delivering training activities for architects, engineers, builders and related professionals.

6. The State Building Commission approved the "Energy Action Plan for Tennessee Buildings" in August 1999. **State policymakers should consider requiring all executive agencies, the Tennessee Board of Regents and the University of Tennessee system to support and participate in the plan.** With assistance from the State Building Energy Management Program (SBEM), participating agencies and institutions would develop a facility-specific energy management plan that support the overall goals and objectives of the Action Plan. Although the plans would have no compliance requirements, SBEM would help participants review progress and periodically develop updates.
7. The Purchasing Division of the Tennessee Department of General Services has developed life cycle costing formulas for various products. **State policymakers should initiate the development of life-cycle costing formulas for other energy-using products that are not currently evaluated**. These include ice making machines, refrigerators/freezers, vacuums, washers and dryers, lamps and ballasts, water coolers, calculators, fax machines, printers, computers and servers, copiers, golf carts, chain saws, tractors and mowers. Applying life cycle costing to these products

would improve the energy efficiency of state agency operations and reduce long-term energy budgets.

8. There is a wide set of strategies that other states have used to improve the energy efficiency of their respective economies. These include a "public benefits charge" on energy consumption that funds state-directed energy efficiency programs; financial incentives that encourage business and industry to install energy efficiency measures; sustainable design programs that encourage energy efficient new construction; and various measures to encourage the development of energy efficiency technologies. **State policymakers should assess the appropriateness of these and other long-term strategies for Tennessee**. In assessing the strategies, policymakers should consider current energy efficiency programs, energy prices and program costs and benefits.

Transportation

New transportation technologies such as alternative fuel vehicles, improved petroleum products, advanced engines and automobile components can have a dramatic effect on the efficiency and emissions of vehicles. Likewise, transportation techniques such as telecommuting, intelligent transportation systems, mass transit and alternative transportation strategies can help reduce emissions and energy use by decreasing the number of vehicle miles traveled. While the emissions per vehicle have decreased over the last 30 years, an increase in miles driven has resulted in an overall increase in the amount of discharged pollutants.

In light of these considerations, the Governor directed the Energy Policy Work Group to develop recommendations on transportation issues. Specifically, Executive Order 27 presented the work group with the opportunity to:

- Evaluate the feasibility of increasing telecommuting opportunities at state offices across Tennessee to decrease office energy needs, reduce pollution and traffic congestion, and increase employee productivity and job satisfaction;
- Identify ways to encourage telecommuting in the private sector;
- Evaluate opportunities to provide new and enhanced alternatives to transport state employees and other commuters to and from work, including additional vans for vanpools, buses, shuttles and eventually light rail and commuter rail systems;
- Assess incentives - including flexible tax benefits offered by the federal government - that will encourage more drivers to use mass transit, especially in the major urban centers of the state;

- Identify and assess other strategies for managing vehicle miles traveled in Tennessee and increasing automobile efficiency;
- Assist and support the development of the refueling and maintenance infrastructure necessary to fuel and maintain alternative fuel vehicles in Tennessee;
- Assess the availability, projected schedules and distribution of low-sulfur gasoline across Tennessee; and
- Cooperate with regional planning efforts to develop alternative regional transportation strategies.

Background Information

The transportation sector accounts for 28 percent of Tennessee's energy consumption. It is the state's second largest energy consumer after the industrial sector. Almost 96 percent of the transportation sector is fueled by petroleum products, including gasoline. The remaining four percent is fueled primarily by natural gas. Tennessee ranks 17th in the United States in terms of transportation energy consumption.

Several state agencies currently implement programs that address transportation-related energy issues. The Tennessee Department of Transportation (TDOT), for example, implements a vanpool program to provide a commuting alternative for state government employees. In addition, TDOT's Commuter Transportation Assistance Program provides funds to metropolitan areas to expand ridesharing services. TDOT also funds various studies affecting transportation alternatives, including partial funding of an

alternative transportation study in the Great Smoky Mountains National Park, and an alternative fuel transit vehicle study with the Electric Vehicle Institute in Chattanooga.

The Tennessee Department of Personnel has developed a draft telecommuting policy that other state agencies can adopt. Presently, the Tennessee Department of Environment and Conservation is the only department that has adopted the policy.

Policy Recommendations

In assessing transportation-related energy issues, state policymakers should consider the following policy recommendations.

1. Telecommuting reduces vehicle use by allowing some employees to regularly perform some or all of their duties at a location other than their official workplace. The growing use of telecommunications, computers and related technology makes telecommuting a viable alternative for an increasing number of employees. **State policymakers should encourage all departments to evaluate telecommuting for their employees**. In addition, policymakers should consider a pilot telecommuting program that would enable state departments to develop, test and verify policies and procedures that would support a successful telecommuting program.
2. Telecommuting is one of several work-related concepts that can reduce vehicle and fuel use by employees. **State policymakers should continue assessing and applying alternative work schedules, teleconferencing and other methods that save time, reduce travel costs and increase productivity**.

3. The daily commutes of state employees working in Tennessee's major metropolitan areas have a significant impact on energy consumption and air quality. **State policymakers should take cost-effective steps to expand TDOT vanpool and carpool programs, including procuring additional vans, seeking federal funds and providing other services that make vanpooling and carpooling attractive transportation alternatives.**
4. A provision of the federal Transportation Equity Act makes it easier for employers to offer benefits to employees for using public transit or vanpools in their daily commute to work. Under the provision, employers may choose to offer employees an employee-paid pre-tax benefit option. **State policymakers should offer a new pre-tax flexible benefit to state employees that use public transit or vanpools in their commute to work.** Under Internal Revenue Service provisions, the state of Tennessee could exclude the amount designated by employees from their taxable income.
5. The federal government, in partnership with major automobile manufacturers and research institutions, has been an important sponsor of research and development initiatives to improve vehicle efficiency. **State policymakers should consider participating in vehicle efficiency efforts by implementing pilot programs that test and demonstrate new technologies.** A possible first step would involve monitoring emerging vehicle technologies and working with federal transportation and energy agencies to test advanced vehicles in real-world situations.

6. The state of Tennessee owns over 500 alternative fuel vehicles in the Nashville area. There is, however, a lack of stations that provide alternative fuel. **State policymakers should provide an alternative fuel facility in the Nashville area.** Policymakers should evaluate the cost-effectiveness of the facility and add additional facilities as needed.

New Technologies and Clean Power Alternatives

Research and development in clean energy technologies offer a long-term energy strategy that recognizes the interdependence of energy, environment and the economy. In light of this consideration, the Governor directed the Energy Policy Work Group to develop recommendations on new technologies and clean power alternatives. Specifically, Executive Order 27 presented the work group with the opportunity to:

- Report on options for the state of Tennessee to support the Tennessee Valley Authority's Green Power Switch program;
- Foster the use of clean renewable energy technologies and systems to mitigate environmental challenges;
- Support commercialization of new technologies that favorably position Tennessee manufacturers for growth as industries of the future in the highly competitive world markets;
- Advance the use of distributed generation technology by developing equitable incentives, reducing regulatory barriers and assessing markets for ancillary service;
- Support continued economic and environmental advantages of clean coal technologies through tax credits for the conversion of existing coal-fired plants; and
- Support the use of geothermal energy to assist and/or provide heating and cooling for buildings.

Background Information

The continued development and application of new technologies and clean power alternatives offer tremendous economic and environmental advantages to Tennessee. Clean coal technologies, for example, expand electric power generation options, reduce emissions and contribute to the use of America's most plentiful energy resource. Distributed generation, powered by combustion gas turbines, fuel cells, wind turbines and other technologies, is another alternative that has the potential to achieve both economic and environmental benefits.

There are a variety of initiatives underway in Tennessee that increase the use of new technologies and expand the state's clean power alternatives. The Tennessee Department of Economic and Community Development (TECD), for example, participates in the federal Industries of the Future program that helps industry identify technology investments that increase productivity, lower costs and reduce emissions. In addition, TECD works with various organizations, including federal agencies and state universities, to coordinate national renewable energy activities and serve as a resource for business and industry. This role has included funding studies, like the state's Greenhouse Gas Emissions Study, which identify the role of new technologies in reducing emissions.

The Tennessee Valley Authority (TVA) has several initiatives that expand the use of new technologies and clean power alternatives in Tennessee. TVA's Green Power Switch program, for example, allows consumers to purchase blocks of electric power produced from renewable sources. Since it began in early 2000 almost 4500 customers have signed up for the program. In another initiative, TVA promotes the use of geothermal exchange systems by providing technical assistance to help customers take

advantage of this efficient technology. Other TVA initiatives address the application of clean coal technologies, wind-powered turbines and small-scale solar applications.

Policy Recommendations

In assessing opportunities to promote new technologies and clean power alternatives, state policymakers should consider the following policy recommendations.

1. Since it began in early 2000, TVA's Green Power Switch program has garnered wide support from both residential and business customers. **State policymakers should take steps to promote TVA's Green Power Switch program.** These steps could include sponsoring contests and other promotional activities that encourage state employees to sign up for the program; enrolling the State Capitol, Governor's Residence and other state buildings in the program; working with TVA to identify green power sites, possibly on state property; and helping disseminate program information through website links, TECD materials and co-hosted events.
2. Public awareness and interest in clean renewable technologies continues to grow. To build on this interest, **state policymakers should support initiatives to develop clean renewable technologies and foster greater use of renewable energy in the Tennessee economy.** Possible initiatives include joining the Governors' Ethanol Coalition; supporting efforts to develop an ethanol plant in West Tennessee; determining private sector interest in biofuels blending and distribution; working with distributors to include an ethanol mix at fuel stations; and encouraging the state of Tennessee motor pool to use ethanol fuel mixes.

3. New technologies and clean power alternatives can help Tennessee manufacturers increase productivity, meet environmental requirements and improve competitiveness. **State policymakers should seek ways to support commercialization of new technologies that benefit manufacturers and position them for future growth.** Possible initiatives include expanding TECD participation in the federal Industries of the Future program; establishing a joint TECD-Tennessee Department of Agriculture effort to expand biomass and wood product industry participation in the Industries of the Future program; coordinating and strengthening federal, state and university partnerships that enhance national funding opportunities for Tennessee industry; and broadening support for the research, development and use of new technologies in energy intensive manufacturing industries.
4. Distributed generation has the potential to contribute to Tennessee's future energy needs and economic growth. **State policymakers should develop a process for reviewing and facilitating distributed generation opportunities that provide both economic and environmental benefits to Tennessee communities.** The process should be based on a partnership between TECD, the Tennessee Department of Environment and Conservation (TDEC) and TVA. Process components should address application and technical requirements, partnership responsibilities, economic and environmental issues and project incentives and barriers.
5. **State policymakers should take steps to support the development and use of clean coal technologies.** This could include promoting national funding

opportunities available through the federal Clean Coal Technologies Program, supporting federal tax credits directed toward clean coal technology development and use and supporting TVA efforts to increase the use of clean coal technology in existing plants.

6. Geothermal exchange is a proven technology that has wide application for efficiently heating and cooling buildings. **State policymakers should support the use of geothermal exchange technology in State of Tennessee buildings and other facilities**. Possible steps include adding geothermal exchange material to Tennessee Department of Commerce and Insurance contractor licensing exams; considering geothermal exchange options when constructing or retrofitting state buildings; requesting that architects working on state projects list expertise in geothermal exchange technology; and working with TVA and local distributors to promote geothermal exchange opportunities.
7. The presence of the Oak Ridge National Laboratory (ORNL) and TVA places Tennessee in a unique position to become a national leader in the development of new technologies and clean power alternatives. To take advantage of this opportunity, **state policymakers should fully develop partnerships that monitor, demonstrate and communicate information on available technologies and practices.** The partnerships – involving business and industry, ORNL, TVA, state agencies, and universities – would serve as an enthusiastic advocate for the increased use of clean renewable energy and expand alternative technology opportunities for Tennessee's energy consumers.

Public Education and Information

Public education and information is an essential component of sound energy policy. It is important that individuals, families and homeowners understand energy issues, how their behavior affects energy use and what they can do to help Tennessee achieve its energy goals.

In light of these considerations, the Governor directed the Energy Policy Work Group to develop recommendations on public education and information. Specifically, Executive Order 27 presented the work group with the opportunity to:

- Communicate the findings and results of energy efficiency projects at state facilities in order to serve as a positive example to industry, small businesses, local governments, schools and homeowners; and support the use of energy efficient building design, technology and operations; and
- Design a comprehensive energy awareness program that educates Tennesseans on the importance of energy conservation; identify steps that citizens can take to reduce energy use; and encourage energy efficient practices.

Background Information

There are several successful information programs that help Tennesseans make sound energy decisions. The Tennessee Department of Economic and Community Development (TECD), for example, administers the Tennessee Energy Education Network that promotes energy education in K-12 schools across the state. In addition, TECD sponsors an information center that provides a toll-free hotline and energy publications for household consumers, small businesses, local governments and students.

TECD also provides energy audits, training and other technical assistance to help small businesses, local governments and school systems identify energy efficiency opportunities and apply for TECD energy loans. The Tennessee Department of Environment and Conservation (TDEC) Green Schools Program, recognizes educational institutions for successful pollution prevention efforts, including energy conservation and elevated environmental awareness.

Electricity and natural gas providers have a long history of providing energy information to their customers. The Tennessee Valley Authority (TVA), for example, sponsors a range of information and education programs, including the Energy Right program that helps households improve energy efficiency and save money. Local electric and natural gas distributors provide energy saving tips to customers through bill stuffers, newsletters and magazines.

Policy Recommendations

In assessing public education and information issues, state policymakers should consider the following policy recommendations.

1. Despite previous efforts to stress conservation and prudent energy use, per capita electricity consumption in Tennessee remains high. **State policymakers should develop a sustained and consistent public awareness campaign that effectively educates Tennesseans on the benefits of wise energy use.** In developing the campaign, the state should seek support and participation from various public and private sector organizations, form

partnerships with news media across the state, and involve recognizable public figures, state officials and celebrity sponsors.

2. Because effective energy education requires a sustained effort, **state policymakers should appoint an ongoing Energy Education Work Group to evaluate the progress of existing programs, revise messages and plans as needed, develop materials, and seek financial support.** The group should include representatives of state agencies in partnership with utilities, nonprofit organizations, and others.
3. The Internet is an invaluable source of information for students, consumers and researchers. **State policymakers should enhance the TECD Energy website so that it serves as a one-stop shop for anyone seeking energy information**. The website should direct information specifically to schools, local governments, utilities, residences, businesses and industry. Possible information and links would include energy guides, energy profiles, financial incentives, energy-saving equipment, programs and partnership opportunities.
4. Improving the energy efficiency of the transportation sector is a challenge for Tennessee and the nation. **State policymakers should consider developing Clean Air Partnerships in major metropolitan areas to offer more transportation choices, enhance mobility and improve air quality**. The partnerships – consisting of state agencies, local governments, transit agencies and members of the business and environmental communities – would educate the public about the linkages between transportation, air quality, energy use, traffic congestion and land use; communicate the advantages of transportation

alternatives and telecommuting; and build support for alternative transportation programs.

5. TVA and other energy providers across the state regularly provide information to consumers about using energy efficiently. **State policymakers should join with energy providers to develop a statewide Home/Consumer Energy Conservation Partnership that has the goal of reducing Tennessee's per capita energy use**. The partnership should focus on home heating, cooling lighting and appliance issues. Its major emphasis should be to develop new mechanisms and strategies communicating information to the public.
6. Energy education in K-12 public and private schools has the potential to contribute to better energy choices by families, schools and students. **State policymakers should consider establishing a formal energy education component in K-12 schools.** The component would help make students, families and school administrators more aware of the importance and benefits of wise energy use.
7. **State policymakers should establish an energy education network of state agencies, schools and other support organizations.** The network would assist in developing, coordinating and funding statewide energy education activities and energy information programs. Its mission would be to achieve an informed student body, support energy efficiency considerations in administrative decisions, train students to deliver energy efficiency messages to the broader community and develop an energy-efficient bus transportation system. The network would hold periodic meetings and conferences that

address various energy topics, including energy efficiency financing, project design and recognition of outstanding achievements.

8. An effective energy education and information program requires long-term actions to achieve energy goals. **State policymakers should develop and maintain a sustainable comprehensive energy awareness program that involves strong partnerships, collaboration with other states and provides the necessary resources.** These components are essential to the success of any education and information program.

Energy Emergency Planning

Now more than ever an energy policy must include contingency planning for emergencies that disrupt energy supplies. Such emergencies can have severe economic consequences and threaten the health, safety and welfare of Tennesseans. Energy emergency planning requires attention to several issues, including supply analysis, damage assessments, service restoration, allocation and public information.

In light of these considerations, the Governor directed the Energy Policy Work Group to develop recommendations that will ensure sound energy emergency planning in Tennessee. Specifically, Executive Order 27 presented the work group with the opportunity to:

- Review and update the existing Tennessee Emergency Management Plan for handling energy emergencies in the state.
- Coordinate with other state and governmental entities that have responsibilities during an energy emergency.

Background Information

The Tennessee Emergency Management Agency (TEMA) established a revised Tennessee Emergency Management Plan (TEMP) in compliance with federal guidelines in the early 1990s. Tennessee counties, in turn, issued new comprehensive emergency plans based on the state plan. TEMP includes a special part addressing energy emergency issues (ESF-12).

ESF-12 addresses all forms of energy production, distribution and storage. Various state agencies, along with TVA, have specific responsibilities in preparing for

and responding to energy emergencies. TVA, for example, is responsible for maintaining its statewide electrical generation and transmission capability. A state agency, the Tennessee Regulatory Authority, has key responsibilities in addressing natural gas pipeline issues, while the TECD Energy Division has petroleum responsibilities. (Public comments regarding petroleum supply issues can be found in the Reliability, Availability, Quality, Price, and Environmental Effects section of this document).

Policy Options

In assessing energy emergency planning issues, state policymakers should consider the following:

1. **State policymakers should review and understand recent ESF-12 updates that place TVA, TRA and the TECD Energy Division as lead agencies**. This action broadens the range of energy emergency issues that can be addressed. It also allows the designated state agencies, with direct statutory authority and support, to assist in leading the response to energy issues during emergency situations.
2. **State policymakers should review and understand ESF 12 updates that give additional state agencies roles in deliberations regarding response and recovery missions during emergencies**. These additional agencies are the Tennessee Department of Agriculture, Department of Finance and Administration, Department of General Services, Governor's Office, Department of Human Services, Department of Personnel, Department of Transportation, Department of Correction, Department of Safety and the Governor's Energy

Policy Work Group. The roles are typical of those which state agencies have been asked to fulfill during past emergencies.

Conclusion

Energy lies at the heart of Tennessee's past success and its hopes for the future. The progress, technological advances and high quality of life that Tennesseans now enjoy can be directly traced to this state's abundant and affordable energy supply. Unlike other areas of the country, Tennessee's energy supply has been a stable, reliable resource that has rarely been questioned.

Tennessee is now facing new challenges. Many states have experienced energy shortages, price spikes and blackouts, and all states are closely examining their energy needs. A collective desire to improve air quality and conserve natural resources has caused government agencies, utilities, motorists, citizens and businesses to seek new and cleaner ways to produce and use energy. A new national energy policy has been created to set the direction of energy use and production in our nation. The terrorist attacks of September 11 and the war in which we are now engaged further heighten awareness of the need for a secure national energy supply.

Tennessee must evaluate the best methods for contributing to the nation's energy needs while maintaining a healthy economy and a clean environment here at home. Tennessee must also seek the greatest return to its citizens in terms of jobs, economic development and environmental quality when planning energy production and use in this state.

To enable Tennessee to meet its future energy needs and achieve increased efficiencies in its current energy use, the Governor directed the Governor's Interagency Energy Policy Work Group and Advisory Committee to make recommendations on the

most critical energy issues in Tennessee. The resulting planning process incorporated input from a range of organizations and individuals.

The planning process produced a set of policy recommendations that address the many aspects of energy production, distribution and use. Several recommendations address supply issues that will enable Tennessee to take advantage of future economic opportunities. Other recommendations address efficiency initiatives that can strengthen local communities while reducing household and business energy costs. Still other recommendations address transportation practices, new technologies and public education initiatives that can benefit both the economy and the environment. And finally, there are recommendations that ensure that Tennessee is prepared in the event of energy emergencies.

Taken together, the policy recommendations presented in this report build on the foundation of Tennessee's past energy success, address areas for improvement and begin to prepare for an even brighter future. The Work Group recommends that under the direction and leadership of the Governor, Tennessee state agencies further develop and implement those recommendations with the most merit and opportunity for success. The work group recommends that specific numerical targets and timelines be developed for those recommendations. It is important that work group participants, Advisory Committee members, and other stakeholders continue to work together to refine and implement these recommendations to strengthen Tennessee's energy future. By working together, we have the opportunity to make Tennessee a national leader in wise and effective energy policy.